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Western Electric Co's Electric Current Indicator.

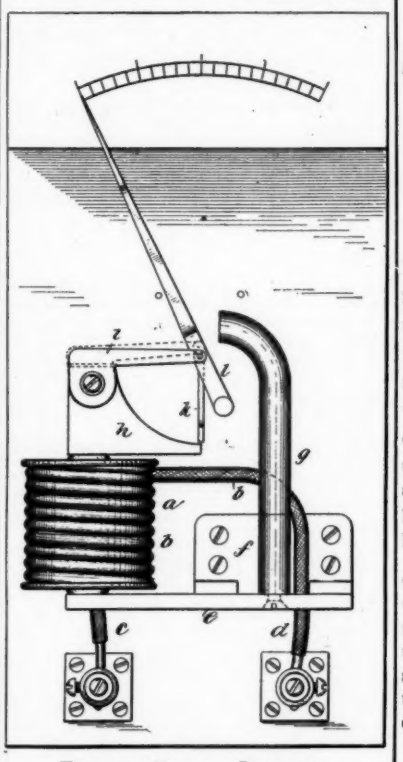
The electro-magnet *a* is wound with coarse wire *b*, connected with binding posts *c d*. The soft iron heel-piece *e* is extended, and supported by the brass bracket *f*. The lower pole of the electro-magnet is still farther extended by the soft iron rod *g*, mounted, as shown, upon the heel-piece, the upper end of the rod being bent, as shown, so as to approach the upper pole of the electro-magnet.

A screw is inserted through the heel-bar into the rod *g* for holding said rod in any position to which it may be adjusted. The upper pole of the electro-magnet is extended by the soft iron piece *h*. The adjustable brass carrier *i*, upon which the armature *k* and pointer *l* are pivoted, is mounted upon the upper portion of the soft iron extension *h*. The armature *k* is suspended at its upper end upon pivots, so as to hang vertically when there is no current passing through the coil of the electro-magnet. The magnet, when energized, acts upon the armature in opposition to the force of gravity. Thus the armature is moved and the needle deflected according to the strength of the magnetic field.

The side of the pole *h* next to the armature is concave, the radius of the curved surface being measured by the radial length of the swinging armature. The initial adjustment of the magnetic field is effected by the hod *g*, after which the final adjustment is affected by raising the pivotal center of the armature above the radial center of the curved surface of the pole sufficiently to cause the free end of the armature as it is swung by the attractive force of the magnet to approach nearer and nearer to the concave surface of the pole. Thus the attractive force of the pole exerted upon the armature increases over and above the increased magnetic power, on account of the gradual approaching of the swinging end of the armature to the surface of the pole. The armature is adjusted so that it will be moved a given distance for each additional ampere in the current. The uniformly graduated scale can thus be placed approximately in position with respect to the needle, and then the instrument adjusted to the scale.

The Bentley-Knight System at Allegheny, Pennsylvania.

The difficulties here are unusual, the grade being heavy and curves sharp, some on grades. The worst grade is one of over ten per cent., and nearly 1,700 feet in length. The system is conduit for about one-half mile, and overhead conductors for the remainder—about two and one-half miles. The conductors are one-half inch copper wires. The power house is located about one-third the distance from one end, and sends current both ways. The power house contains two 125 horse power tubular boilers, and a nominal 200 horse power Buckeye automatic engine, driving 4 Thomson-Houston constant potential dynamos, each giving nominally 250 volts and 100 amperes. They are coupled two in series for 500 volt potential in the line. Four cars are operated, each provided with two nominal 15 horse power series wound motors, arranged in multiple arc. Speed is regulated by a rheostat under the car platform, operated by the brake-handle. The cars are brightly lighted by four 16 candle power incandescent lamps in the center of each. The change from conduit "plow" to "trolley," and *vice versa*, is made readily during a momentary stop.



ELECTRIC CURRENT INDICATOR.

The heavy grades are surmounted with the aid of a cast steel rack laid alongside one rail, into which mesh spurs cast on the tread of one of the car wheels, giving a grip which is considered necessary in the circumstances. It is said that a car loaded with forty passengers readily mounts the long grade at a speed of eight miles an hour. They certainly cap the climax as to cost of fuel. The charge for natural gas, which is used under the boilers, is only $2 per day.

The road is not yet in full operation, but one or more cars are making regular trips daily.

Electricity and Dentistry.

Dr. George W. Whitefield, of Chicago, entertained the Chicago Electric Club, on the 6th instant, with an illustrated talk on "Electricity in the Dental Office." He rang the door bell, examined teeth, bored and hammered, and polished teeth; he used electrically-produced heat for drying out cavities, and he bleached those which were internally discolored, by electricity. Few present were aware of the many uses to which electrical energy is applied by ingenious professors of dental surgery. His illustrations were very apt, and largely original as well as ingenious.

One experiment was particularly interesting, and showed how slight a cause may work a deal of mischief in one's mouth, where one had considered the greatest of care had been taken. In a toothbrush handle the doctor had fitted a gold filling and an amalgam filling, and attached moisture-proof wires, connecting these to the poles of a galvanometer. The least moisture upon the fillings showed the presence of an electrical current—and when, after chewing a pickle, the doctor placed the two fillings in his mouth, the needle of the galvanometer fairly went wild. The experiment perfectly explains how, with fillings of unlike metals, the best work of the best dentist may be destroyed by the electrolytic action thus set up, in loosening the fillings by dissolving the tissues in contact with the metal.

BUSINESS TRANSACTED AT THE ELECTRIC LIGHT CONVENTION.

A Comprehensive and Interesting Review of the Work of the Convention aside from the Reading of Papers and Discussions.

At the Pittsburgh Convention of the National Electric Light Association, Feb. 21, 22 and 23, the usual rapid dispatch of business was more noticeable than at any previous meeting. We presented last week a number of the papers read before the convention, and a general account of the work done from the beginning, at Tuesday noon, to the closing, Thursday afternoon. Several additional papers, with the discussion they provoked, appear in this issue under their proper heading.

We give in what follows a succinct, continuous account of the business of the convention, so that all our readers may readily find a perfect record without reading through the discussions which appear in full (or have appeared) elsewhere. As a matter of course the most business was transacted on the last day, and we give it full room:

FIRST DAY—TUESDAY, FEB. 21.

President Morrison, of Baltimore, calling the convention to order at 12 M., delivered the opening address. Major W. C. Moreland, of Pittsburgh, welcomed the delegates on behalf of the mayor of the city.

Invitation of the Engineers' Society of Western Pennsylvania, to attend their meeting that evening, was accepted, and the privileges of the convention extended to the engineers.

Letters and telegrams were received and filed.

The contribution of $1,150 from the several Westinghouse companies was received and a vote of thanks given the donors.

The report of the secretary and treasurer was read, showing a membership of 178, a debt of $98 and $971 in the treasury. (This did not include, of course, the Westinghouse gift.)

The executive committee made its report. Portions of it were approved. A few recommendations were laid over for discussion.

Messrs. Duncan, Moses and Weeks were appointed a committee to report on the recommended increase in the annual dues, from $10 to $20 per annum.

Prof. Geo. Forbes, of England, was elected an honorary member.

Upon motion of E. T. Lynch, jr., the president appointed the following committee on nominations and place of meeting: Messrs. Lynch, Weeks, Ridlon, Stanley, Garratt.

The committee on insulation, consisting of Prof. Elihu Thomson, Prof. Louis Duncan, Geo. Hamilton, T. D. Lockwood, Dr. Leonard Waldo, O. B. Shallenberger and Dr. Otto A. Moses, was continued.

SECOND DAY—WEDNESDAY, FEB. 22.

Upon motion of Dr. Otto A. Moses, Prof. E. L. Nichols, the successor of Prof. Anthony, of Cornell, was elected an honorary member of the association and his name added to the committee on insulation. Mr. E. G. Acheson, of Pittsburgh, was by vote of the convention added to the same committee, but on hearing of it he tendered his resignation, giving as the reason his connection with a wire and cable manufacturing company. The resignation was accepted with regret.

Mr. Duncan, of the executive committee, offered a previously announced substitute for Art. VIII of the constitution. It was adopted, and is as follows:

"Art. VIII.—The annual dues shall be $20, payable in advance, and shall cover the calendar year."

This changes the dues from $10 to $20 per annum, and does away with an initiation fee. In presenting the resolution, Mr. Duncan announced that the probable expenses of the association would be $3,000 per annum.

Mr. Frank Ridlon offered the following resolution, which was laid over one day:

Resolved, That Article IV of the constitution be hereby amended to read as follows:

The president and vice-presidents shall be elected by ballot to serve during the following meeting. The treasurer and the secretary who may be one and the same person, shall be nominated by the president, subject to the approval of the executive committee. The executive committee shall be chosen by ballot at each meeting, either annual, semi-annual or special, to hold office from the close of the meeting at which they are elected until the end of the meeting at which their successors are chosen.

THIRD DAY—THURSDAY, FEBRUARY 23.

The amendment to the constitution reported the previous day was first in order.

Mr. DeCamp moved to lay upon the table.

Mr. Ridlon hoped this would not be done. Favored electing the president from locality where meeting was held.

President Morrison thought the matter important and deserving of full discussion.

Mr. Leggett, of Detroit, agreed with Mr. Ridlon, but preferred that the chairman of the executive committee be elected from the city where the meeting was to be held. Said the convention had realized the advantage of this in the admirable arrangements made by Mr. Duncan at Pittsburgh.

Mr. Weeks, of Kansas City, said he understood the purpose of the amendment was to strengthen the hands of local parties in preparing for conventions. He said the matter had been suggested, not by him, but by others, with a view of carrying out certain suggestions that he had made with regard to holding a convention in the West. Continuing, Mr. Weeks said: "I have suggested that our next annual convention be held in Kansas City. One cannot fail to be struck by the lack of Western representatives. While in the West we have hundreds of plants—nearly every city and town in Missouri, Illinois, Kansas, Nebraska and Colorado being provided with electric light plants—still they have not sent delegates to our convention; and on speaking to them personally about it I could not induce them to do so, on account of the great expense of time and money necessary to come East to attend a meeting of the association. Now, it has been thought